PROGRAM 1: Exploring AWS CloudShell and the AWS Cloud9 IDE

Steps for creating CloudShell

Step 1: Login to AWS Account

Step 2: Open CloudShell

Step 3: Execute shell commands in the terminal
Step 4: Choose Download file from Actions dropdown menu

Step 5: Provide the path to the file created (demo.txt)
Step 6: An empty file "demo.txt" is downloaded

Step 7: Add content in the downloaded file(demo.txt) and save
Step 8: Execute 'rm' command. To upload file, click on Upload file option from the Actions dropdown
menu

Step 9: Upload demo.txt file
Step 10: Once uploaded successfully, check the contents of demo.txt using the 'cat' command

Steps for creating VPC Environment

Step 1: From the Actions menu choose 'Create VPC environment'
Step 2: Give a VPC name and choose VPC, Subnet and the default security group. Click on Create

Step 3: Execute the same commands as of CloudShell in the VPC window except for download
and upload file options

Step 4: Once all the commands are executed delete the VPC

Step 5: Also delete the CloudShell once the commands are executed

Steps to create EC2 instance

Step 1: Open EC2 in AWS Console and click on Launch Instance

Step 2: Name the instance and proceed below
Step 3: Click on create new key pair .Create a new key pair by providing a name

Step 4: Keep the default options for the rest and click on Launch Instance

Step 5: Confirmation of the launch of our new instance

Step 6: Click on Instances. It displays the instances that are running. Click on Instance ID to know
about a particular instance.
Step 7: Click on the Connect option on the top-right to connect to an instance

Step 8: Keep the default options and click on Connect
Step 9: An Amazon-Linux terminal is displayed

Step 10: Execute the commands executed in VPC in this terminal

Step 11: The CloudShell button on the bottom-left corner can be clicked to open a shell terminal. We can
execute commands and create VPC here

Step 12: Delete the EC2 instance after execution by clicking on Terminate(delete) instance

Step 13: Indicates the successful termination of the instance. Also delete the corresponding key pair and
Security groups associated with this instance

User can sign-out of the AWS account after these steps.

PROGRAM 2: Working with DynamoDB which makes use of PartiQL

Steps for creation of DynamoDB User

Step 1: Login to AWS account. Search for DynamoDB
Step 2: Select "Tables" from the left panel and click on "Create Table"
Step 3: Enter the details by giving the table name as "student" and partition key as "USN"
Step 4: Select "Customize Settings" under Table Settings and select "DynamoDB
standard- IA" under Table Class
Step 5: Click on "Create Table". Once the table is created successfully click on the

highlighted table link
Step 6: Click on the “Explore table items”

Step 7: Click on “Create item”

Step 8: Create a new item by filling up the Attributes such as Name, Dept, Sem, Sec, Batch. And click on “Create item”
Step 9: The Table shows the item created
Step 10: Create another item using JSON view (Java Script Object Notation)
Step 11: Create a total of 4-5 items using Form or JSON view

Step 12: Click on the “PartiQL editor” on the left panel. Click on the 3 dots next to the students and it will provide ways in the table can be viewed

Step 13: If we click on “scan table” the whole table will be visible

Step 14: Click on “Query table” -> Clear ->Replace the USN value with any of the given values->Run
Step 15: Now Click on “Set item”, once it is executed, select “scan table” for the updated table

Step 16: Click on “Drop item”, and once again select the “scan table” for the updated table

Step 17: Delete the table “student”, by clicking on “Delete” under “Actions”

PROGRAM 3 : Developing REST APIs with Amazon API Gateway

Steps for creating a REST API:

Step 1: Open AWS and Sign In to the Console.
Step 2: Open Amazon API Gateway dashboard.
Step 3: Choose an API type window appears scroll down to find REST API and click Build.
Step 4: Select New API, give a name and scroll down, click on Create API.

Step 5: Successful creation notification is displayed, click on Create method.
Step 6: Open link in new tab and create Lambda Function.
Step 7: Enter the function name and ‘Python 3.13’ as runtime.
Step 8: Enable function URL and keep Auth type as NONE.
Step 9: Now, go to REST API, choose create method, choose HTTP and HTTP method, and choose
lambda function, paste function ARN and create method.

Step 10: Successfully created ‘GET’ method.

Step 11: In Deploy API dialog box give Stage as ‘New Stage’ and give it name then click on Deploy
Step 12: Successfully created deployment for MyRESTAPI.
Step 13: copy the Invoke URL to new Tab and view Output.

Steps for Deletion of REST API:

Step 1: Select the API been created and click on ‘Delete’.

Step 2: To confirm the action, enter ‘confirm’ and click on delete.

Step 3: Select the lambda function been created and click on ‘Actions’ then click on delete.

Step 4: To confirm the action, enter ‘confirm’ and click on delete

Step 5: Lambda function is deleted successfully

PROGRAM 4: Migrating a Web Application to Docker

Steps for creating an EC2 Instance
Step 1: Open AWS and Sign In to the Console.
Step 2: Open Amazon EC2 dashboard.
Step 3: Fill the Name and select ‘Amazon Linux’

Step 4: Click on create key pair and generate new pair.
Step 5: Enable HTTPS and HTTP traffic.
Step 6: Instance has been successfully launched
Step 7: Click on instance and select ‘connect’.
Step 8: Then again click on ‘connect’.

Steps for migrating a Web Application to Dockers:

Step 1: Amazon Linux Shell is opened
Step 2: Run ‘sudo yum update -y’ command to update or get newer features if available
Step 3: Run ‘sudo yum install docker -y’ command

to install Docker application on our instance.
Step 4: Run 'sudo service docker start' command to start docker service on our instance.
Step 5: Run 'sudo service docker status' command to check if Docker is running.
Step 6: Run 'sudo su' and 'docker version' command to go to root directory on our instance and to check
version of Docker installed.
Step 7: Run 'docker pull nginx' command to download the nginx web application from Docker's
repository.
Step 8: Run 'docker images' command to see downloaded application images.
Step 9: Run 'docker run -d -p 80:80 nginx' and 'docker ps' command to start the nginx application
and to check the status of running processes under docker.

Step 10: Copy the public IP Address (e.g. 13.233.73.122/) to a new tab to view the running nginx
application.

Steps for Deletion of EC2 instance:

Step 1: Select the EC2 instance been created and click on 'Instance state' and the click on 'Terminate
instance'.
Step 2: EC2 instance has been successfully terminated.

PROGRAM 5: Caching Application Data with ElasticCache, Caching with Amazon CloudFront, Caching Strategies.

Steps for creating an ElasticCache:
Step 1: Open AWS and Sign In to the Console.
Step 2: Open Amazon ElasticCache
Step 3: On the left side of the screen click on 'Redis OSS caches' and click on 'create cache'.
Step 4: Click on 'Continue with Redis OSS'.
Step 5: Select 'Redis OSS' as an Engine, select 'Design your own cache' for Deployment option, select 'Cluster cache' for Creation method and enable the cluster mode.
Step 6: Fill the Cluster name and disable 'Multi-AZ'.
Step 7: Select '7.0' as an Engine version, port as '6379' and Node type as 'cache.t3.micro'.The 'Number of shards' should be 2 and 'Replicas per shard' should be 1.

Step 8: Click on 'Create a new subnet group' and fill the name of the subnet.
Step 9: Click on Manage and select 'us-east-1a and us-east-1b'.

Step 10: Select 'Specify Availability Zones' option under Availability Zone placements.

Step 11: Open a new tab and open EC2.
Step 12: On the left side of the screen click on 'Security Groups' and click on 'create security Groups'.
Step 13: Fill the name, port range as '6379' and source as 'Anywhere IP4v'.
Step 14: Security group has been created successfully.
Step 15: Now come back to the ElasticCache, select 'AUTH default user access' in Access control and
enter the 'AUTH token'.
Step 16: Disable the 'Backup' and enable 'slow logs'.

Step 17: Select 'Text' for the Log format, click on 'Create a new log group' and then enter the log group
name.

Step 18: Click on 'Create' to create a cluster.
Step 19: Cluster has been created successfully.

Steps for Deletion of Cluster:

Step 1: Select the cluster been created and click on 'Actions' and the click on 'Delete'.
Step 2: The cluster been created has been successfully deleted.